

We claim:

1. A process for preparing a ketone by reacting cyclododecatriene with dinitrogen monoxide to obtain cyclododecadienone.
- 5 2. A process as claimed in claim 1, wherein the dinitrogen monoxide source is at least one dinitrogen monoxide-containing offgas of at least one industrial process.
- 10 3. A process as claimed in claim 2, wherein the dinitrogen monoxide source is the offgas of an adipic acid plant and/or of a dodecanedioic acid plant and/or of a hydroxylamine plant and/or of a nitric acid plant operated with the offgas of an adipic acid plant and/or of a dodecanedioic acid plant and/or of a hydroxylamine plant.
- 15 4. A process as claimed in any of claims 1 to 3, wherein cyclododecatriene is reacted with a gas mixture containing from 20 to 99.9% by weight of dinitrogen monoxide, based on the total weight of the gas mixture.
- 20 5. A process as claimed in any of claims 1 to 4, wherein the dinitrogen monoxide or the gas mixture containing dinitrogen monoxide is used in liquid form.
- 25 6. A process as claimed in any of claims 1 to 5, wherein the reaction is carried out at a temperature in the range from 140 to 350°C and a pressure in the range from 1 to 1000 bar.
- 30 7. A process as claimed in any of claims 1 to 6, wherein the reaction has a conversion of cyclododecatriene in the range from 1 to 80% at a selectivity based on cyclododecadienone of at least 90%.
8. A process as claimed in any of claims 1 to 7, wherein the cyclododecatriene is cis,trans,trans-1,5,9-cyclododecatriene and is reacted in (ii) with dinitrogen monoxide to give cyclododeca-4,8-dienone.
- 35 9. A process as claimed in any of claims 1 to 8, wherein the cyclododecadienone obtained from the reaction of cyclododecatriene with dinitrogen monoxide is hydrogenated to obtain cyclododecanone.

10. A process as claimed in claim 9, wherein the hydrogenation is carried out in the presence of a hydrogenation catalyst at a temperature in the range from 0 to 250°C and a pressure in the range from 1 to 325 bar.
- 5 11. A process for preparing cyclododecanone, comprising the steps (I) and (II)
- (I) reacting cyclododecatriene with dinitrogen monoxide to obtain cyclododecadienone;
- 10 (II) hydrogenating the cyclododecadienone obtained in (I) to obtain cyclododecanone.
12. A process as claimed in claim 11, wherein the dinitrogen monoxide source used is at least one offgas comprising dinitrogen monoxide from at least one industrial process.
- 15 13. A process as claimed in claim 12, wherein the dinitrogen monoxide source is the offgas of an adipic acid plant and/or of a dodecanedioic acid plant and/or of a hydroxylamine plant and/or of a nitric acid plant operated with the offgas of an adipic acid plant and/or of a dodecanedioic acid plant and/or of a hydroxylamine plant.
- 20 14. A process as claimed in any of claims 11 to 13, wherein cyclododecatriene is reacted with a gas mixture containing from 20 to 99.9% by weight of dinitrogen monoxide, based on the total weight of the gas mixture.
- 25 15. A process as claimed in any of claims 11 to 14, wherein the dinitrogen monoxide or the gas mixture containing dinitrogen monoxide is used in liquid form.
- 30 16. A process as claimed in any of claims 11 to 15, wherein the reaction in (I) is carried out at a temperature in the range from 140 to 350°C and a pressure in the range from 1 to 1000 bar.
- 35 17. A process as claimed in any of claims 11 to 16, wherein the reaction in (I) has a conversion of cyclododecatriene in the range from 1 to 80% at a selectivity based on cyclododecadienone of at least 90%.
18. A process as claimed in any of claims 11 to 17, wherein the cyclododecatriene used is cis,trans,trans-1,5,9-cyclododecatriene and is reacted in (I) with dinitrogen monoxide to give cyclododeca-4,8-dienone.

19. A process as claimed in any of claims 11 to 18, wherein the hydrogenation in (II) is carried out in the presence of a heterogeneous hydrogenation catalyst at a temperature in the range from 0 to 250°C and a pressure in the range from 1 to 325 bar.